Traditions of early human groups in Baja California and possible routes for the peopling of the peninsula

HARUMI FUJITA^{1,*} AND AMIRA F. AINIS²

¹*Centro INAH B.C.S., Legaspy 1637, Col. Los Olivos, La Paz, BCS, 23040, Mexico*

²*Museum of Natural and Cultural History, Department of Anthropology, University of Oregon, Eugene, OR*

ABSTRACT.—Ideas concerning the initial peopling of the Baja California Peninsula have dramatically changed in recent decades. In the late 19th and early 20th centuries, the native inhabitants of the southern part of the Baja California Peninsula were believed by some to have come from Melanesia, based on the perceived similarity in skull morphology. Since the middle of the 20th century, most researchers propose that initial populations entered from the north by land, bringing with them 2 distinct cultural traditions. The first wave was thought to have been an incursion of Paleoindians with Clovis-type fluted points. The second wave refers to groups who occupied ancient lake shores, such as Laguna Seca Chapala, and who were considered as belonging to the Western Pluvial Lakes (WPL) tradition. Eventually people moved down to the southern tip of the peninsula, pushed by subsequent groups. The entry of human groups from the Mexican mainland across the islands in the central Gulf of California has also been suggested; early entries by other groups have been proposed as well. A migration from Australia to the Cape Region across the southern Pacific has also been argued. This paper summarizes recent archaeological evidence from radiocarbon dates, geomorphological settings, subsistence strategies, and material types and technologies indicating that Paleo coastal migrants may have reached the Cape Region during the Terminal Pleistocene. However, some of the early lithic artifacts and technologies in the Cape Region show similarities to the WPL tradition, such as leaf-shaped points, an eccentric crescent, and end and side scrapers. This evidence suggests that perhaps a Paleo coastal group and a WPL group reached the southern part of the peninsula at around the same time and that they had some kind of interrelation that is reflected in their lifestyles and materials, which were principally adapted to coastal life.

RESUMEN.—Las opiniones acerca de la población inicial en la península de Baja California cambiaron drásticamente en las últimas décadas. A fines del siglo XIX y principios del siglo XX, se creía que los habitantes nativos del sur de la península de Baja California provenían de Melanesia, basándose en la similitud percibida en la morfología craneal. Desde mediados del siglo XX, la mayoría de los investigadores proponen que las poblaciones iniciales ingresaron por tierra desde el norte, trayendo consigo dos tradiciones culturales distintas. Se pensó, que la primera ola inmigratoria se debió a la incursión de paleoindios con lanzas acanaladas de punta Clovis. La segunda ola se refiere a grupos que ocuparon las antiguas orillas de los lagos, como el de Laguna Seca Chapala, quienes fueron considerados como pertenecientes a la tradición de los lagos pluviales occidentales (WPL, por sus siglas en inglés). Eventualmente, la gente se trasladó al extremo sur de la península, impulsada por subsecuentes grupos. Asimismo, se sugirió el ingreso de grupos humanos por tierras mexicanas, a través de las islas del Golfo central de California, y la entrada de otros grupos en épocas más recientes. Finalmente, se argumentó la migración proveniente de Australia hacia la Región del Cabo en el Pacífico sur. Este artículo resume reciente evidencia arqueológica obtenida mediante datación por radiocarbono, las características geomorfológicas, las estrategias de subsistencia y tipos de materiales y tecnologías, indican que los migrantes paleo costeros pudieron llegar a la Región del Cabo a finales del Pleistoceno. Sin embargo, algunos de los primeros artefactos y tecnologías líticas en la Región del Cabo, tales como lanzas con forma de hoja, láminas en forma de media luna excéntricas y raspadores laterales, muestran similitudes con los de la tradición de WPL. Esta evidencia sugiere que probablemente un grupo Paleo costero y un grupo de los WPL llegaron al sur de la península casi al mismo tiempo y tuvieron alguna clase de interrelación, la cual se refleja en sus estilos de vida y materiales, que se adaptaron principalmente a la vida costera.

Several hypotheses have been presented concerning the nature of the initial human occupation of the Baja California Peninsula (Fig. 1). In the late 19th and early 20th centuries, the native inhabitants of the southern

part of the Baja California Peninsula were believed by some to have come from Melanesia, based on the perceived similarity in skull morphology (Rivet 1909) in the analyses conducted by ten Kate (1883) and Diguët (1905).

*Corresponding author: harumifuj@gmail.com

Fig. 1. Locations of Early Holocene sites and areas with a concentration of early sites on the Baja California Peninsula.

This hypothesis, however, did not consider factors such as mutation, material culture, and differences in environments and time periods.

In the middle of the 20th century, 2 prevalent scenarios emerged suggesting that the inhabitants followed a terrestrial route from the north. These hypotheses continue to be supported among researchers. The first hypothesis suggests the incursion of Paleoindians with Clovis-type fluted points (Aschmann 1952, Gutiérrez and Hyland 2002). Elsewhere in North America the Paleoindian

and Clovis culture was a hunting tradition focused on Pleistocene megafauna such as mammoths, bison, and mastodons. The technology of Clovis-type fluted points and blades was followed by Folsom fluted points. The lithic elements in workshops of Paleoindian sites show evidence of reduction from formal conical cores and wedge-formed cores, as well as the reduction of bifaces.

The second scenario is the entry of hunting groups that occupied ancient lake shores (Arnold 1957). Later classified as the Western

Fig. 2. Locations of Western Stemmed-like projectile points discovered in Baja California.

Pluvial Lakes (WPL) or Western Stemmed Point (WSP) tradition, they may have entered the peninsula before, contemporary with, or after the Clovis tradition. Typical WPL artifacts include stemmed points, leaf-shaped points, and end and side scrapers. The San Dieguito complex (Rogers 1966, Porcayo Michelini 2005) is considered a regional variant of the WPL tradition. The concept of the WPL tradition proposed by Bedwell (1973) refers to a lifestyle oriented and adapted to ancient lakes that covered many valleys and extensive lowlands throughout the Great Basin between 11,000 and 8000 years ago. A large number of stemmed points such as the Lake Mojave and Silver Lake types were found in these lowland areas, though not all sites of the WPL tradition contain stemmed points (Beck and Jones 1997, Davis et al. 2012). In Paisley Cave in Oregon, various obsidian stemmed points were found in Terminal Pleistocene deposits along with a human coprolite sample dated to $12,450 \pm 30$ BP (Jenkins et al. 2012). Several Western Stemmed points have been found on the peninsula of Baja California. Ritter (2006:103, 104) reports on the discovery of 2 Lake Mojave and Silver Lake-like points from Concepción Bay (Fig. 2). In addition, a projectile point similar to Silver

Lake types was found on the surface at a site along the southern Pacific coast of the peninsula at the Faro Punta Marqués site (Figs. 2, 3; Fujita and Hernández Velázquez 2017). This projectile point is elongated and slender, and lateral morphology displays differences on both sides. One side has a very weak shoulder and the other exhibits a weak side notch indentation. The dimensions of this point are 4.55 cm long, 1.85 cm wide, and 0.9 cm thick. The raw material is rhyolite, which has a much coarser grain than chert and obsidian. The points found in Baja California display some similarity in form but significant differences in raw material and technology, so they cannot be clearly classified as Western Stemmed points; instead, they can be classified as Western Stemmed-like points. Some researchers have suggested that the initial groups were pushed south to the tip of the peninsula as other groups moved in from the north (Rogers 1945, Massey 1966, Kowta 1984). However, it seems that local social and cultural developments in response to local requirements and climatic fluctuations also played an important role.

The entry of human groups from the Mexican mainland across the islands (such as Tiburón, San Esteban, San Lorenzo, and

Fig. 3. A Silver Lake-like point from the Faro Punta Marqués site on the southern Pacific coast of Baja California.

Ángel de la Guarda Islands) in the central Gulf of California has also been suggested, and early entries by other groups have been proposed as well (Kowta 1984). However, no diagnostic materials from the Terminal Pleistocene/Early Holocene have been uncovered on any of these islands or in the surrounding areas (Bowen 2009). Although it has been pointed out that much of the archaeology of Baja California is unknown, archaeological investigations increased in some regions of the peninsula after the beginning of the 21st century, especially in the north, in the central region including Sierra de San Francisco and Sierra de Guadalupe, on Cedros Island, and in the Cape Region (Laylander and Moore 2006).

Recent archaeological evidence suggests additional early entries by other human groups. Radiocarbon dates, geomorphological settings, subsistence strategies, material types, and technologies indicate that Paleocoastal

migrants may have reached the Cape Region by the Terminal Pleistocene (Fujita 2010, 2014, Fujita and Melgar 2014, Fujita and Porcayo Michelini 2014, Fujita et al. 2017). Select artifacts from Terminal Pleistocene and Early Holocene contexts in the Cape Region are similar to those identified for the WPL tradition and Paleocoastal sites in California and the Great Basin (Table 1). Similar lithic artifact types include leaf-shaped projectile points, an eccentric crescent, and end and side scrapers. However, there are some differences. In the Cape Region sites, the use of shells and coral for tools, containers, and ornaments was prominent, as were milling tools (Fig. 4). At the Covacha Babisuri site on Espíritu Santo Island (Fig. 5), some unique items were uncovered in the lowest cultural stratum (ca. 12,000–8000 BP). Fossil shells, both modified and unmodified, dated between 35,500 and >47,500 years ago, were used

TABLE 1. Cultural elements in Paleocoastal sites/areas and Western Stemmed Point tradition sites (including San Dieguito sites)^a. X = presence.

Cultural elements	Paleocoastal Tradition								Western Pluvial Lakes Tradition				
	ChI ^b	RPN	DC	IC	AE	CB	CC	CT	LCh	AP	CP	IZ	PC
Stemmed points	X		X	X		X							X
Barbed stemmed points	X												
Leaf-shaped points or knives	X	X	X	X	X	X				X	X	X	
Elongated bifacial knives		X										X	
Large elongated bifaces									X				
Crescents	X	X				X						X	
Milling stones			X	X	X	X	X						
Pitted stones			X			X	X						
Scrapers		X	X	X	X	X	X	X	X		X	X	
Blades		X	X			X	X						
Drills						X	X					X	
Bone gorges	X												
Shell fishhooks				X		X							
Olivella spire-lopped beads	X		X		X	X		X					
Shell tools (scrapers, knives, punches or drills)				X		X	X	X					
Shell containers						X	X	X					
Fossil shell tools and containers						X	X	X					
Fluted pearls						X							
Coral reamers						X		X					
Worm shell tubes (pipes or straws?)						X							
Bone tools	X		X			X							
Use of red ochre	X					X							

^aData were compiled from the following sources: Moratto 1984, Porcayo Michelini 2005, Gruhn and Bryan 2008, Fujita 2008, 2010, 2014, Des Lauriers 2010, Jenkins et al. 2012, Fujita et al. 2013, Fujita and Melgar 2014, Fujita and Muñoz 2014b, Fujita and Porcayo Michelini 2014, and García Hernández et al. 2015.

^bChI = Northern Channel Islands, RPN = Rancho Park North, DC = Diablo Canyon, IC = Isla de Cedros, AE = Abrigo de los Escorpiones, CB = Covacha Babisuri, CC = Cerro de la Calavera #1, CT = Cueva Tecolote #2, LCh = Laguna Chapala, AP = Abrigo Paredón, CP = Cerro Pinto, IZ = Ignacio Zaragoza, PC = Paisley Cave.

for containers and tools, especially scrapers (Fujita and Melgar 2014). Fluted pearl oyster (*Pinctada mazatlanica*) and clam (*Megapitaria* sp.) pearls were used to manufacture ornaments (Fig. 6b; Fujita et al. 2017). Pearl oysters were used to make fish hooks (Fig. 6c) and purple olive shells (*Callianax* spp.) were used to make spire-lopped beads (Fig. 6a). Fragments of coral were used as abraders (Fig. 6d) and worm snails (Vermetidae) served as straws or pipes (Fig. 6e, f; Fujita 2010, 2014, Fujita and Melgar 2014, Fujita et al. 2017). Most of these tools and ornaments continued to be manufactured and utilized during the Middle Holocene, except the fossil shells. Fishing, shellfish gathering, and sea turtle hunting were the principal subsistence activities, complemented by plant gathering. These characteristics are also considered part of the Paleocoastal tradition.

The hypothesis of the Paleocoastal tradition suggests that the first people to enter the Baja California Peninsula arrived from the Canadian

and U.S. Pacific coast (Fladmark 1979, Rick et al. 2001, Erlandson et al. 2007). This theory received more support when eminent American archaeologists accepted the antiquity of the first occupation of 12,500 BP at the Monte Verde site in Chile, which is older than Clovis sites that are considered to be between 11,050 to 10,800 calendar years ago (Dillehey 1997, Meltzer et al. 1997, Fledge and Christensen 1999, Walters and Stafford 2007). There are human occupation sites of Terminal Pleistocene and Early Holocene age on the western coast of Canada and the United States, notably on California's Channel Islands, with evidence of the exploitation of marine resources (Carlson 1990, 1996, Ackerman 1992, Dixon 1993, 1999, Erlandson 1994, Erlandson and Moss 1996, Rick et al. 2001, 2013, Raab et al. 2009, Erlandson et al. 2011). Due to subsequent sea level rise, it is probable that the majority of the early sites located on or near the coast have been submerged. The early inhabitants collected shellfish, fished for a variety of

Fig. 4. Locations of Early Holocene sites in the La Paz area, Baja California Sur.

species, and captured a variety of marine mammals in addition to using terrestrial resources, principally plants in some regions. The dependence on terrestrial animal hunting appears to have been relatively low in coastal areas.

Beck and Jones (2010) suggested that the makers of chipped stone crescents and Western Stemmed points typical of the WPL tradition may have descended from coastal peoples who migrated from northeast Asia into the Americas. As they explored Pacific shorelines, some of these Paleocoastal people may have spread eastward, following major rivers to the lakes and marshes of the Great Basin and the Intermountain West. Erlandson et al. (2011) suggested that Paleocoastal stemmed points and crescents from the Channel Islands may provide a technological link between the Terminal Pleistocene stemmed point traditions of northeast Asia, the Pacific Northwest, and

South America. A migration from Australia to the Cape Region across the southern Pacific has also been argued based on craniometric studies (González-José et al. 2003). However, investigators have more recently proposed that the Cape Region inhabitants shared common ancestry with other native North Americans but had diverged as a result of isolation and the operation of random genetic factors (Laylander and Moore 2006:7).

TERMINAL PLEISTOCENE AND EARLY HOLOCENE SITES IN BAJA CALIFORNIA

In 1952 Homer Aschmann (1952) reported a Clovis point found on the surface at the ranch of San Joaquín located in the Sierra de San Francisco area in the central part of the peninsula (Fig. 1). In the same period, lithic tools including large bifaces and scrapers were observed on the edge of ancient Laguna Seca

Fig. 5. Locations of 11 Terminal Pleistocene and Early Holocene sites dated to between 12,000 BP and 8000 BP on Espiritu Santo Island.

Chapala (Fig. 1), and Brigham Arnold (1957) and William Massey (1955, 1966) suggested that these sites might correspond to the Terminal Pleistocene and Early Holocene time periods. However, because these discoveries were made prior to the widespread use of radiocarbon dating, their antiquity was not proven.

Almost half a century later, additional archaeological discoveries of evidence of early human groups in Baja California were reported (Table 2). These include 2 more Clovis points in the Sierra de San Francisco region in the central part of the peninsula (Fig. 1) and a charcoal sample from excavations in the Cueva Pintada site that was dated to $10,860 \pm 90$ BP (12,983–12,643 calBP) (Gutiérrez and Hyland 2002).

A charcoal sample from the Abrigo de los Escorpiones rock shelter on the west coast of northern Baja California was dated to 8870 ± 60 BP (10,184–9738 calBP). Chipped stones, milling stones, and hammer stones as well as

shell and vertebrate faunal remains—principally sea lion with some fish, bird, sea otter, whale, and artiodactyl remains—were found in the Early Holocene deposits (Gruhn and Bryan 2008).

A charcoal sample from the Abrigo Paredón site near Laguna Seca Chapala has been dated to 9070 ± 60 BP (10,414–10,151 calBP) (Gruhn and Bryan 2008). This site appears to have been used as a workshop to reduce large felsite biface preforms to smaller and thinner bifaces and leaf-shaped points and knives (Gruhn and Bryan 2008:6).

On Cedros Island in the Pacific Ocean, 2 sites were excavated and various charcoal and shell samples were dated to earlier than 10,000 BP. The oldest charcoal date was $10,380 \pm 60$ BP (12,520–12,476 calBP) and the oldest shell date was $10,745 \pm 25$ BP (12,323–11,892 calBP) (Des Lauriers 2010). Projectile points, knives, and scrapers as well as shell tools associated with fish, sea turtle,

Fig. 6. Shell ornaments and tools from the Covacha Babisuri site: **a**, *Olivella* spire-lopped bead; **b**, *Pinctada mazatlanica* fluted pearl; **c**, pearl oyster fishhook preform; **d**, coral abrader; **e**, pipe or straw of worm shell (*Vermetidae*) with one end abraded; **f**, detail of the polished end of the worm shell straw with a fragment of shell attached at its end.

TABLE 2. Chronology for Terminal Pleistocene and Early Holocene archaeological sites in Baja California, Mexico^{a,b}. The oldest radiocarbon dates from each site are shown in the table (nd = not dated).

Region	Site or area name	Cultural tradition	RYBP	Cal BP (1 sigma)	Cal BP (2 sigma)	Lab number	Material dated
North	Cerro Pinto	San Dieguito	nd	nd	nd		
	Ignacio Zaragoza	San Dieguito	nd	nd	nd		
	Abrigo de los Escorpiones	Paleocoastal	8870 ± 60	10,157 : 9901	10,184 : 9738	Beta-144835	wood charcoal
	Abrigo Paredón (Laguna Chapala)	WPL	9070 ± 60	10,266 : 10,185	10,414 : 10,151	Beta-115420	wood charcoal
	Cueva Pintada	not determined	10,860 ± 90	12,820 : 12,688	12,983 : 12,643	not published	wood charcoal
Central	Rancho San Joaquín, Batequi	Paleoindian	nd	nd	nd		
	Cedros Island	Paleocoastal	10,745 ± 25	12,169 : 11,981	12,323 : 11,892	UCIAMS-14388	<i>Mytilus</i> sp.
	A56 Cerro de la Calavera #1	Paleocoastal	8410 ± 83	8782 : 8521	8934 : 8441	INAH-3269	<i>Glycymeris gigantea</i>
	A110 Caimancito #2	Paleocoastal	8130 ± 40	8389 : 8306	8432 : 8220	Beta-204269	<i>Chione californiensis</i>
	A111 Caimancito #3	Paleocoastal	8170 ± 40	8419 : 8334	8494 : 8295	Beta-204272	<i>Chione californiensis</i>
La Paz area	A119 Cañada de la Enfermería Sureste #3	Paleocoastal	9356 ± 109	10,035 : 9670	10,145 : 9544	INAH-3449	<i>Trachycardium procerum</i>
	A175 Abrigo Rocoso Tecolote #1	Paleocoastal	9426 ± 77	10,120 : 9853	10,173 : 9690	INAH-3091	<i>Hyotissa hyotis</i>
	A176 Cueva Tecolote #2	Paleocoastal	9454 ± 101	10,159 : 9859	10,225 : 9656	INAH-3283	<i>Larkinia multicostrata</i>
	A16 El Pulguero Surroeste	Paleocoastal	9470 ± 60	10,137 : 9936	10,191 : 9807	Beta-251150	<i>Strombus gracilior</i>
	A183b Loma Tecolote #4	Paleocoastal	8683 ± 79	9181 : 8947	9274 : 8774	INAH-3099	<i>Spondylus crassiscapula</i>
Espíritu Santo Island	Z36 El Ranchito 2	not determined	8955 ± 84	9464 : 9281	9522 : 9239	INAH-3108	<i>Hyotissa hyotis</i>
	J18 La Dispensa II-8	Paleocoastal	8081 ± 73	8366 : 8212	8446 : 8133	INAH-1751	<i>Chama frondosa</i>
	J69B La Ballena 3	Paleocoastal	8090 ± 60	8372 : 8237	8415 : 8164	Beta-233677	<i>Lobatus galeatus</i>
	J57 El Gallo I-8	Paleocoastal	8320 ± 50	8584 : 8452	8664 : 8393	Beta-236265	<i>Chione californiensis</i>
	J30 San Gabriel 10	Paleocoastal	8320 ± 70	8599 : 8426	8737 : 8371	Beta-233673	<i>Larkinia multicostrata</i>
	J69D La Ballena 3	Paleocoastal	8770 ± 60	9242 : 9057	9325 : 8986	Beta-233678	<i>Chama frondosa</i>
	J94A El Gallo III-1	Paleocoastal	9400 ± 50	10,070 : 9833	10,128 : 9716	Beta-236269	<i>Saccostrea palmula</i>
	J69C La Ballena 3	Paleocoastal	9480 ± 60	10,146 : 9949	10,199 : 9826	Beta-236268	<i>Spondylus crassiscapula</i>
	J65 El Gallo II-2	Paleocoastal	9663 ± 76	10,356 : 10,174	10,490 : 10,106	INAH-2544	<i>Hyotissa hyotis</i>
	J17 Covacha Babisuri	Paleocoastal	10,970 ± 60	12,285 : 11,992	12,367 : 11,871	Beta-236259	<i>Turbo fluctuosus</i>
	J69E La Ballena 3	Paleocoastal	11,284 ± 121	12,696 : 12,431	12,776 : 12,145	INAH-1770	<i>Hyotissa hyotis</i>

^aRadiocarbon dates were compiled from Cutiérez and Hyland 2002; Grünh and Bryan 2008; Des Lauriers 2010; Fujita and Porcayo Michelini 2014; and Fujita and Hernández del Villar 2016.

^bRadiocarbon dates were calibrated using Calib 7.0.4; a delta R of 250 ± 20 was applied to marine shells for the southern Gulf of California sites and 50 ± 25 for the northern Pacific Baja California shell.

^cWestern Fluvial Lakes.

Fig. 7. Composition of faunal remains in Early Holocene deposits at the Covacha Babisuri site. Note: “marine reptiles” refers to marine turtles.

TABLE 3. Composition of vertebrate remains from Early Holocene deposits at the Covacha Babisuri site.

Marine or terrestrial	Taxon	Common name	NISP ^a
Terrestrial vertebrates	Ophidia	snakes	4
	Leporidae	rabbits and hares	10
	<i>Sylvilagus</i>	rabbits	3
	Rodentia	mice and rats	23
	<i>Odocoileus</i>	deer	2
Marine or terrestrial birds	Aves	birds	33
	Teleost and elasmobranch	fish, sharks, and rays	4309
	Chelonia	sea turtles	128
Marine vertebrates	Pinnipedia	sea lions and seals	2
	<i>Zalophus</i>	sea lions and seals	6
	Cetacea	whales, dolphins, and porpoises	4
Unidentified vertebrates	unidentified vertebrates		568

^aNumber of individual specimens

and sea otter remains were recovered from the Terminal Pleistocene/Early Holocene deposits at these sites (Des Lauriers 2010).

In the Cape Region there are 20 sites that correspond to the Terminal Pleistocene and Early Holocene: 11 sites on Espíritu Santo Island including Covacha Babisuri (Fig. 5), 8 sites in the area between La Paz and Tecolote–El Pulguero, and one site on the eastern slope of the Sierra de las Cacachilas (Fig. 4; Fujita and Poyatos 2007, Fujita 2010, Fujita and Melgar 2014, Fujita and Bulhusen Muñoz 2014a, 2014b). The Covacha Babisuri site contains the earliest excavated sample of archaeological materials. In the lowest stratum, a marine shell was dated to $10,970 \pm 60$ BP

(12,367–11,871 cal BP); more than 100 radio-carbon samples from this site establish the antiquity of various occupational periods.

Shellfish remains are abundant in these early sites, implying a significant focus on marine resources. Marine faunal remains at the Covacha Babisuri site account for more than 99% of all faunal specimens in the Early Holocene deposits, with shellfish constituting ~89%. Remains of terrestrial fauna are present in extremely low numbers, accounting for <1% of the faunal assemblages (Fig. 7, Table 3). Among the shellfish remains, mangrove oyster (*Saccostrea palmula*) was the most often consumed, followed by *Turbo fluctuosus*, *Strombus gracilior*, pearl oyster (*Pinctada*

TABLE 4. Frequency of shellfish taxa uncovered in the Early Holocene levels of the Covacha Babisuri site, Espiritu Santo Island, Baja California Sur.

Bivalve taxon	Number of valves	Gastropod taxon	Minimum number of individuals
<i>Saccostrea palmula</i>	33635	<i>Turbo fluctuosus</i>	4444
<i>Pinctada mazatlanica</i>	7703	<i>Strombus gracilior</i>	3953
<i>Carditamera affinis</i>	1467	<i>Nerita scabricosta</i>	2209
<i>Chione californiensis</i>	2035	<i>Persististrombus granulatus</i>	1994
<i>Chione undatella</i>	976	<i>Lobatus galeatus</i>	512
<i>Codakia distinguenda</i>	788	<i>Stramonita biserialis</i>	349
<i>Dosinia ponderosa</i>	1440	<i>Cerithium maculosum</i>	241
<i>Myrakeena angelica</i>	51	<i>Crucibulum</i> spp.	164
<i>Lyropecten subnodosus</i>	849	<i>Trypsycha</i> sp.	39
<i>Callista squalida</i>	615	<i>Neorapana tuberculata</i>	70
<i>Glycymeris gigantea</i>	888	<i>Fusinus dupetitthouarsi</i>	64
<i>Hyotissa hyotis</i>	359	<i>Hexaplex erythrostomus</i>	59
<i>Pinna rugosa</i>	201	<i>Neverita aulacoglossa</i>	48
<i>Glycymeris maculata</i>	215	<i>Callianax</i> sp.	63
<i>Laevicardium elatum</i>	582	<i>Collisella</i> sp.	20
<i>Chama frondosa</i>	94	<i>Pseudozonaria annettae</i>	51
<i>Modiolus capax</i>	212	<i>Conus</i> sp.	44
<i>Spondylus crassisquama</i>	224	<i>Vasula speciosa</i>	30
<i>Chama mexicana</i>	39	<i>Malea ringens</i>	37
<i>Callista aurantiaca</i>	129	<i>Macrocypraea cervinetta</i>	37
<i>Larkinia multicostrata</i>	99	<i>Oliva</i> sp.	43
<i>Pseudochama</i> sp.	41	<i>Crepidula</i> sp.	31
<i>Arca pacifica</i>	71	<i>Conus princeps</i>	17
<i>Euvora vogdesi</i>	90	<i>Uvanilla</i> sp.	49
<i>Isognomon janus</i>	41	<i>Vasum caestus</i>	17
<i>Tucetona multicostrata</i>	19	<i>Tribulus planospira</i>	11
<i>Spondylus limbatus</i>	23	<i>Neverita reclusiana</i>	2
<i>Trachycardium consors</i>	19	<i>Hexaplex nigrilus</i>	19
<i>Periglypta multicostrata</i>	37	<i>Thaisella kiosquiformis</i>	11
<i>Barbatia reeveana</i>	36	<i>Oliva porphyria</i>	6
<i>Trachycardium procerum</i>	22	<i>Triplofusus princeps</i>	7
<i>Glycymeris</i> g. or <i>Dosinia</i> p. ^a	33	<i>Pomaulax spiratus</i>	8
<i>Argopecten ventricosus</i>	12	<i>Turritella</i> sp.	5
<i>Tivela</i> sp.	3	<i>Pseudozonaria</i> sp.	6
<i>Chione tumens</i>	8	<i>Arquitectonica nobilis</i>	1
<i>Leukoma grata</i>	5	<i>Neorapana muricata</i>	5
<i>Trigoniocardia biangulata</i>	2	<i>Cymia tectum</i>	2
<i>Larkinia grandis</i>	1	<i>Favartia lappa</i>	2
<i>Chione</i> sp.	1	Mitridae	1
<i>Spondylus</i> sp.	2	unidentified	29
<i>Anadara tuberculosa</i>	1	TOTAL	14,700
<i>Chama buddiana</i>	1		
<i>Pitar berryi</i>	1		
unidentified	63		
TOTAL	53,133		

^a*Glycymeris gigantea* or *Dosinia ponderosa*

mazatlanica), *Nerita scabricostata*, *Persististrombus granulatus*, and other bivalves and gastropods (Table 4, Fig. 8). Fish and urchin remains are also present at most of the sites but in much lower densities. At the Covacha Babisuri site, 18 fish and elasmobranch families and one fish order were identified in the Early Holocene deposits, among which Balistidae (trigger fish), Scombridae (tuna), Serranidae (grouper), Carangidae (mackerel),

Diodontidae (porcupine fish), Scaridae (parrot fish), and Lutjanidae (red snapper) were the most common (Fig. 9; Guía 2008, 2011). Although the frequency of tuna remains is high, we do not believe that this necessarily suggests the use of boats for pelagic fishing because juveniles especially are known to be caught close to shore. Sea turtle, sea lion, chiton, crab, deer, hare, and rabbit remains were also recovered in some of these sites. Shell

Molluscan remains in Early Holocene deposits at the Covacha Babisuri site

Fig. 8. Composition of shellfish remains in Early Holocene deposits at the Covacha Babisuri site.

Fish taxa in Early Holocene deposits at the Covacha Babisuri site

Fig. 9. Fish taxa identified in Early Holocene deposits at the Covacha Babisuri site.

and coral tools, containers, and ornaments in addition to diverse types of lithics were the principal artifacts; similar shell artifacts were also found in early sites on Cedros Island but not on the Channel Islands to the north (Des Lauriers 2010). In addition, one bone awl was also uncovered in the early deposits at the Covacha Babisuri site.

The sites of Ignacio Zaragoza and Cerro Pinto in northern Baja California are considered Early Holocene sites exhibiting the San Dieguito cultural tradition based on the similarity of their lithic assemblages to those of San Dieguito sites in other regions, although there have been no radiocarbon analyses. Lithics from these sites include leaf-shaped

projectile points, eccentric crescents, knives, scrapers, drills, burins, hammer stones, and choppers (Porcayo Michelini 2005, 2009; Fujita and Porcayo Michelini 2014).

TERRESTRIAL MIGRATION ROUTES

The presence of these early sites suggests 2 different scenarios: The first is that early inhabitants arrived by land and the second is that they followed a coastal route along the Pacific. The terrestrial scenario has 2 variants, known as the Paleoindian incursion and the Western Pluvial Lakes (WPL) or Western Stemmed Point (WSP) tradition, including the local variant known as the San Dieguito complex (Fig. 10; Moratto 1984, Bryan 1988, Beck and Jones 1997).

In Baja California, Clovis points have been found in the Sierra de San Francisco area (Aschmann 1952, Hyland and Gutiérrez 1995), on Cedros Island (Des Lauriers 2010), and near Ciudad Constitución (C. Mandujano, personal communication, 2013); no Clovis points have been reported in the northern or southern parts of the peninsula. In addition, no lithic workshops for this type of point have been identified on the peninsula. As for Western Stemmed points, Ritter (2006) reported the presence of projectile points similar to Lake Mojave and Silver Lake types on the surface near Concepción Bay in the south central part of the peninsula (Fig. 2). The characteristics of the tools and the geomorphological nature of the Laguna Seca Chapala, Ignacio Zaragoza, and Cerro Pinto sites suggest associations with the WPL tradition (Porcayo Michelini 2005, 2009, Fujita and Porcayo Michelini 2014). A projectile point similar to Silver Lake types was found on the surface at a site along the southern Pacific coast of the peninsula at a site designated as Faro Punta Marqués (Figs. 2, 3; Fujita and Hernández Velázquez 2017).

COASTAL MIGRATION ROUTE

The early sites on Cedros Island, the sites located between La Paz and Tecolote, and the sites on Espíritu Santo Island have characteristics distinct from both terrestrial traditions with respect to some of the archaeological materials and faunal remains. At these sites diverse species of fish, sea lions, marine turtles, shellfish, crustaceans, and sea urchins were

exploited and specific artifacts such as shell tools (fish hooks, scrapers, drills), shell containers and ornaments, coral abraders, and worm pipes were used (Fig. 6a–f). At the Covacha Babisuri site on Espíritu Santo Island, cetacean, deer, and hare remains were also recovered (Table 3).

The human groups of the Late Pleistocene and Early Holocene with strong orientations toward marine resources are considered Paleo-coastal people (Davis et al. 1969, Moratto 1984, Erlandson et al. 2007, 2008, 2011, Erlandson 2012, Jones and Kennett 2012). Some researchers consider this tradition to be a variant of the WPL tradition (Davis et al. 1969). Alternatively, the WPL tradition may have descended from coastal peoples who migrated from northeast Asia to the Americas, and some of these Paleocoastal people may have spread eastward, following major rivers to the lakes and marshes of the Great Basin and the Intermountain West (Beck and Jones 2010, Erlandson and Braje 2011, Erlandson 2012). In spite of the presence of lithic artifacts common to both traditions, there are other artifacts exclusive to the Paleocoastal tradition, such as tools made of shells and coral, including ornaments, containers, and fish hooks (Table 1). Subsistence remains reveal a very strong orientation to the exploitation of marine resources, complemented by plant gathering and terrestrial animal hunting to a minor extent.

It is likely that the majority of early coastal sites were submerged by the rise in sea level at the end of the Pleistocene, submerging the record of the earliest sites between Cedros Island and Espíritu Santo Island. On both islands technology was developed for fishing and capturing sea turtles and other marine vertebrates (i.e., shell fish hooks and lance points). Fish hooks were manufactured with pearl oysters (*Pinctada mazatlanica*; Fig. 6c) on Espíritu Santo Island and mussel shells (*Mytilus*) on Cedros Island (Des Lauriers 2010, Fujita 2010, 2014, Fujita and Melgar 2014).

As for tools, Clovis and leaf-shaped projectile points, knives, end scrapers, and side scrapers as well as shell tools were recovered on Cedros Island (Table 1; Des Lauriers 2010). A variety of artifacts composed of end and side scrapers, unimarginal knives, projectile points, a fragment of an eccentric crescent, blades and flakes with and without retouch, and cores

Fig. 10. Possible early migration routes on the Baja California Peninsula.

were recovered at Covacha Babisuri (Table 1; Fujita 2010, Fujita and Melgar 2014). It is important to mention that milling and hand stones, hammer stones, and abraders were present during this early period. The most frequent projectile point type is leaf-shaped. The majority of these points could have been used as knives and one could have been a drill. A single fragmentary stemmed point was recovered from the early deposits of Covacha Babisuri. It does not have barbed shoulders, which is different from the Channel Islands stemmed points, and the presence of shoulders is different from the Western Stemmed Point pattern (Fujita and Melgar 2014). The presence of leaf-shaped points and an eccentric crescent is similar to the WPL and Paleo-coastal traditions.

The shell and coral tools and containers were important components of archaeological assemblages on both islands, especially Espíritu Santo (Fig. 6d, Table 1). Fossil shells radiocarbon dated between 35,500 and more than 47,500 years old were utilized as tools and containers at the Covacha Babisuri site (Table 1; Fujita 2010, Fujita and Melgar 2014).

The presence of partially or fully fluted *Pinctada mazatlanica* pearls and Olivella (*Calilianax* spp.) spire-lopped beads at Covacha Babisuri indicates their use as ornaments from a very early period (Fig. 6a, b; Table 1; Fujita 2010, 2014, Fujita et al. 2017). Additionally, marine worm shells (Vermetidae) with one extremity polished were recovered and were possibly used as straws or pipes (Fig. 6e, f; Table 1; Marlett 2014:135).

FINAL CONSIDERATIONS

Based on the early-period evidence from sites on Cedros Island, Espíritu Santo Island, and the La Paz area, the most probable migration scenario is that the initial peopling of Baja California was undertaken by groups whose subsistence was principally oriented to the exploitation of marine resources and complemented by plant gathering and hunting: Paleo-coastal people. These people may have followed the Pacific coast from western Canada and the northwestern United States. After passing Cedros Island, they may have arrived at the tip of the peninsula. Some entered into the Gulf of California, while others may have continued south. Those who entered the Gulf

of California would have discovered a large productive bay (because Espíritu Santo Island was connected with the peninsula until ~8500 years ago) where they found coastal areas with plentiful resources that satisfied all of their requirements (Fig. 10; Fujita 2006, 2010, Fujita and Melgar 2014). At present in Mexico, the Paleo-coastal tradition is only reported from sites on the Baja California Peninsula. It is also probable that a WPL hunting tradition group arrived at the Cape Region at around the same time, adopting a coastal lifeway or entering into some kind of relationship with a Paleo-coastal group that is reflected in their lifestyles and materials, which were principally adapted to coastal life.

In conclusion, the group that arrived at the Cape Region of the peninsula either by land or by sea stayed and developed its own culture, oriented to an exploitation of abundantly available marine resources and continuing from approximately 12,000 years ago until the 18th century.

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